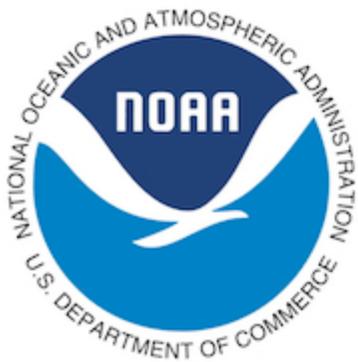


Ocean Forecasts for Marine Resource Management

Mike Jacox

NOAA Southwest Fisheries Science Center
NOAA Earth System Research Laboratory

November 7, 2018



2017 NOAA MAPP/NMFS Competition: “Research to explore seasonal prediction of coastal high water levels and changing living marine resources”



NOAA National Ocean Service (NOS):

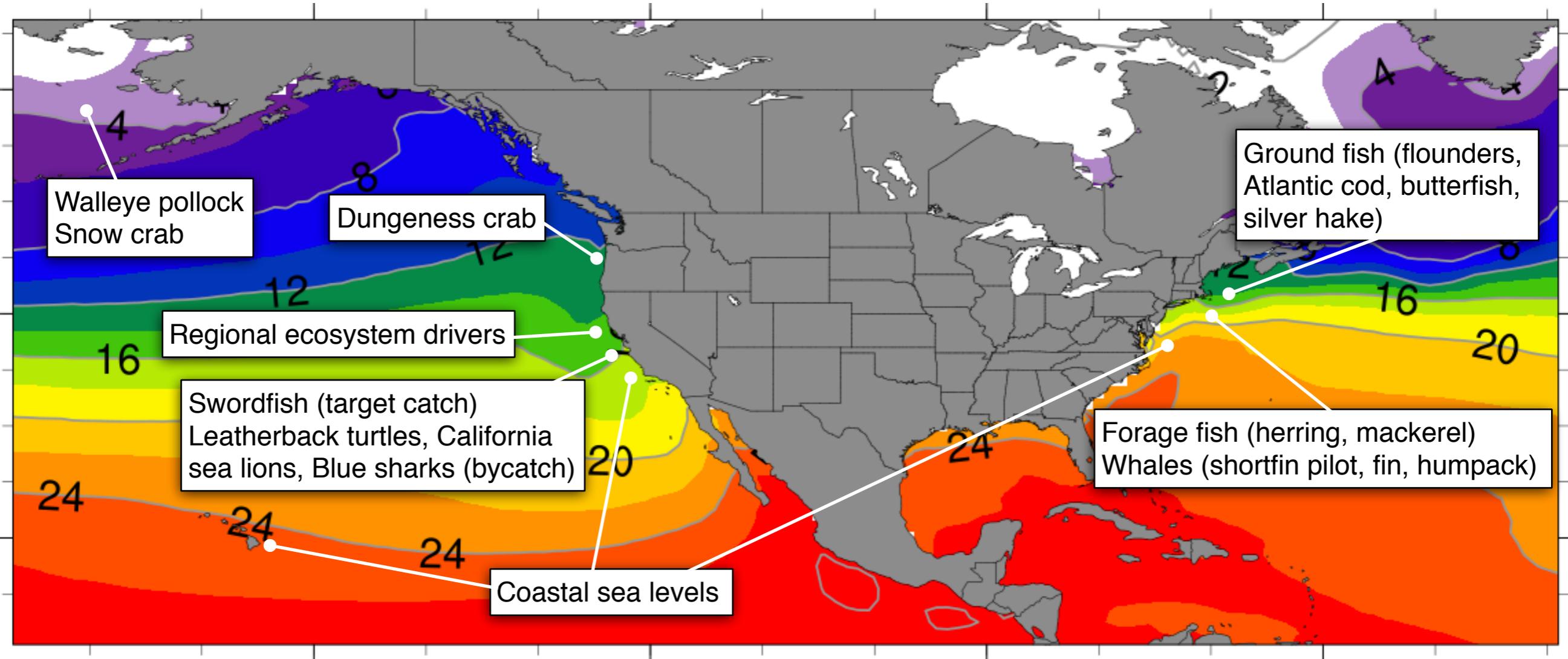
Coastal resilience and coastal intelligence through improved products and services

NOAA National Marine Fisheries Service (NMFS):

Increased production, delivery and use of climate-related information in fisheries management and protected species conservation



2017 NOAA MAPP/NMFS Competition: “Research to explore seasonal prediction of coastal high water levels and changing living marine resources”

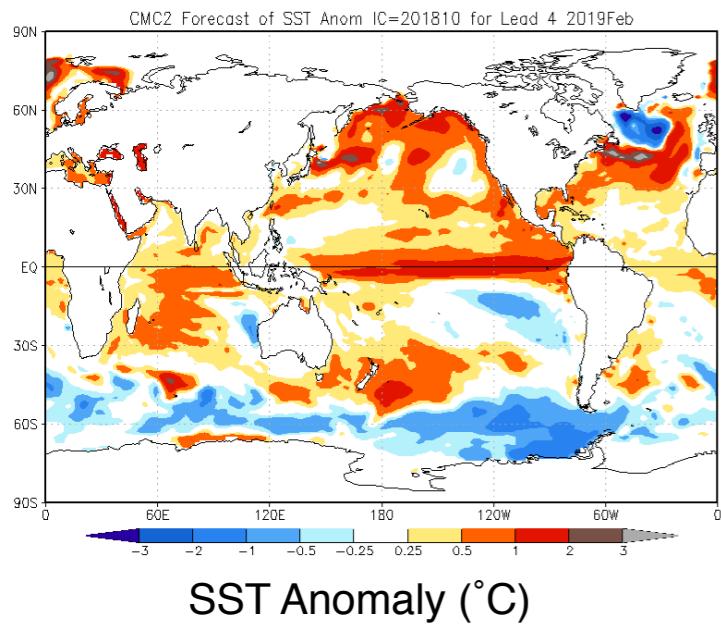


The **Marine Prediction Task Force** coordinates the activities of researchers on 8 projects supported through the MAPP/NMFS FY17 grant competition

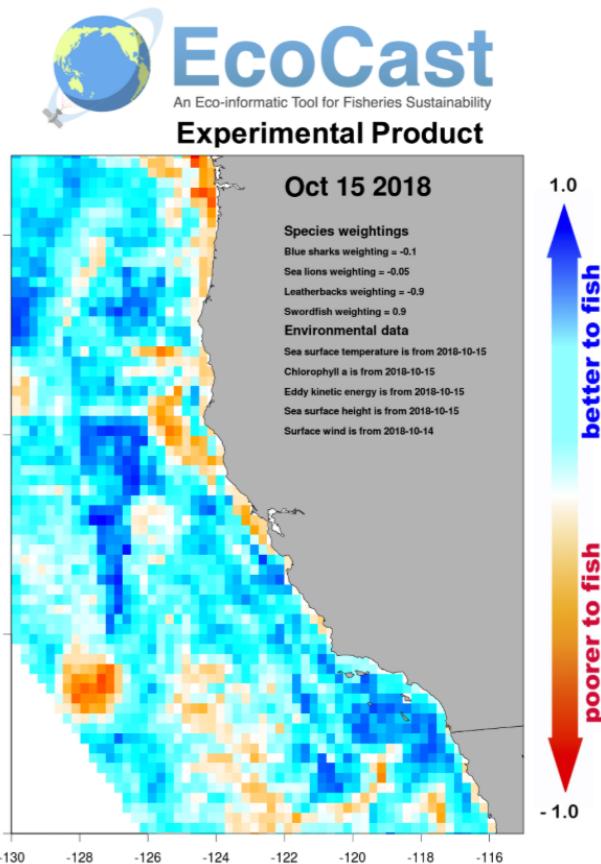
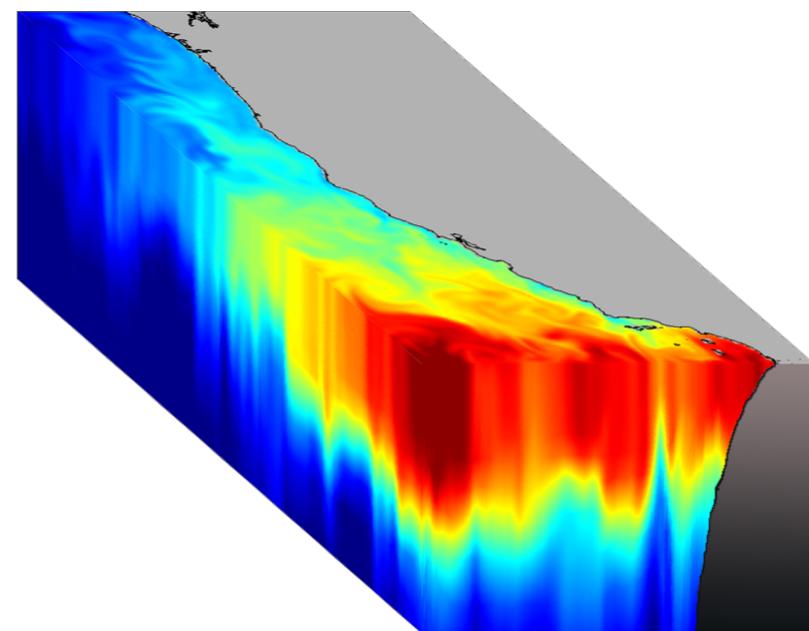
Co-chairs are Mark Merrifield, Antonietta Capotondi, and Mike Jacox



Global Model (CanCM4)
Oct. 2018 Forecast of Feb. 2019



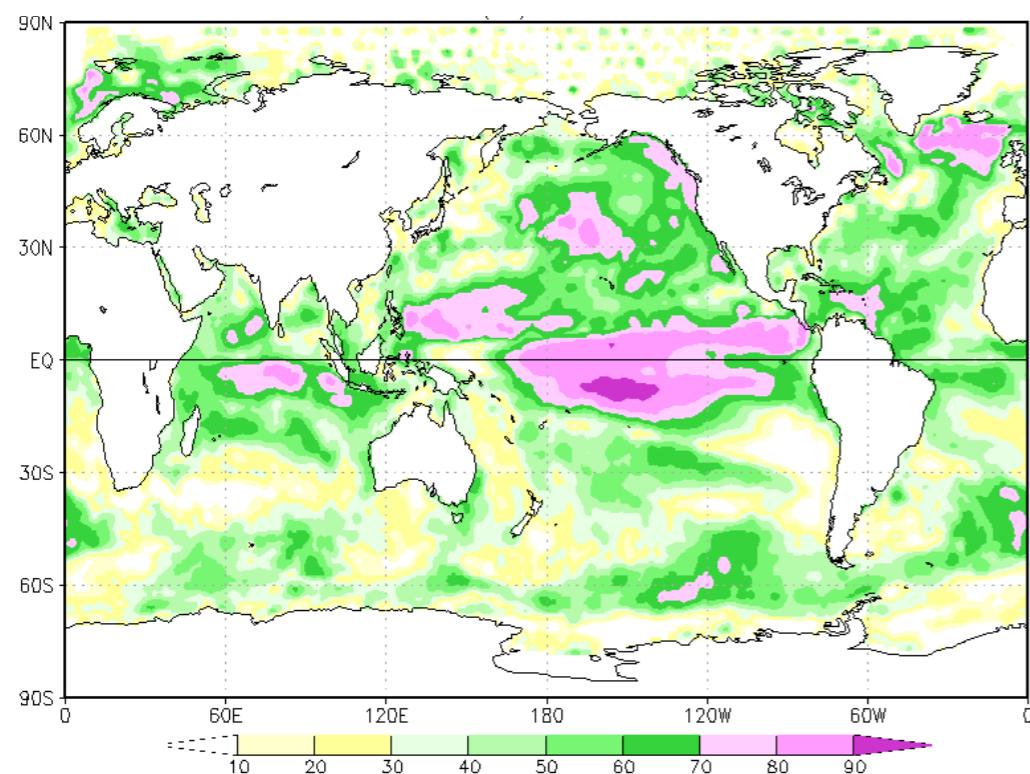
Regional Ocean Modeling System
California Current System



<http://www.cpc.ncep.noaa.gov/products/NMME/>

Hazen et al. (2018), Welch et al. (2018)

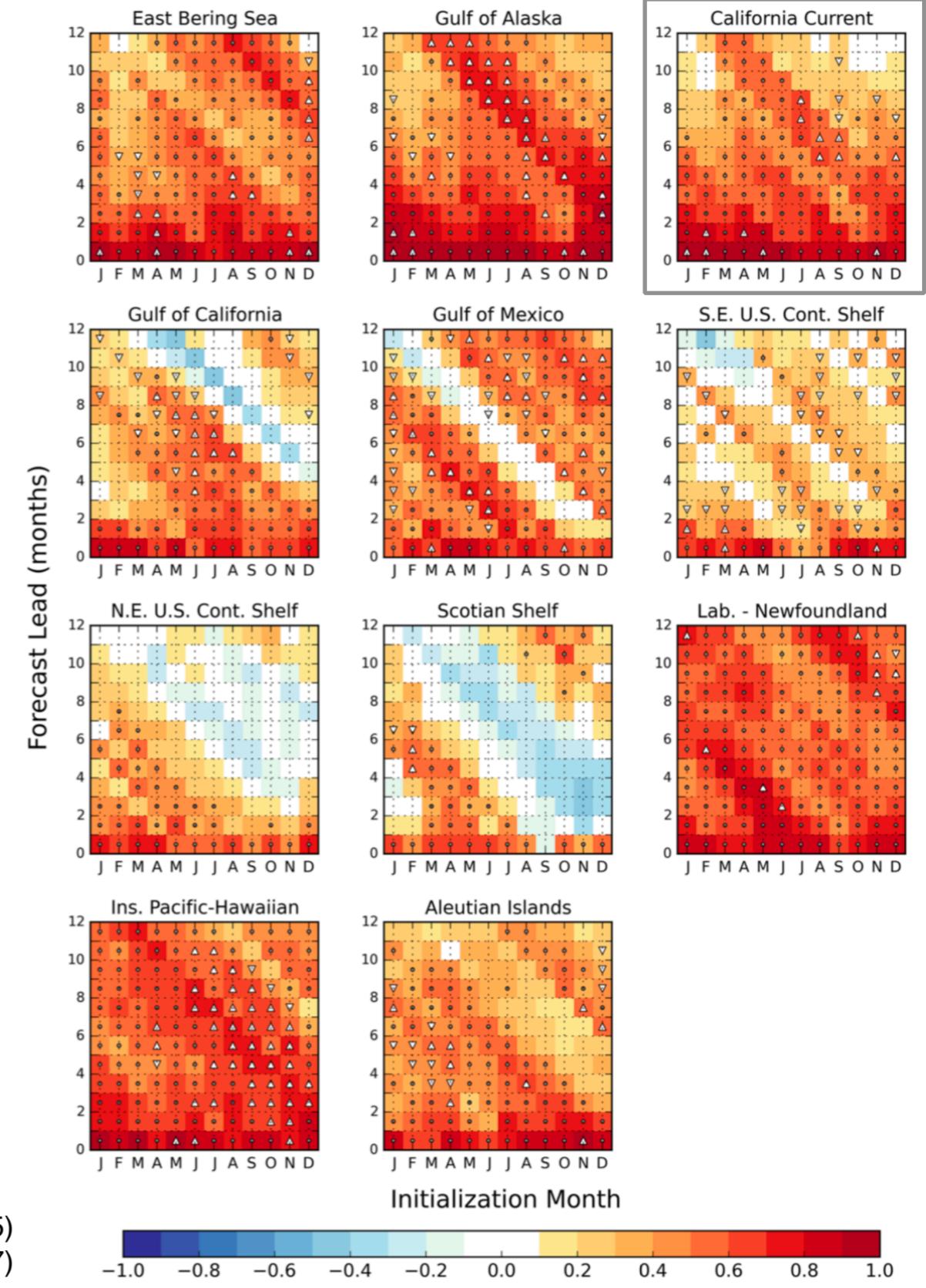
NMME 4-month lead SST Forecast Skill

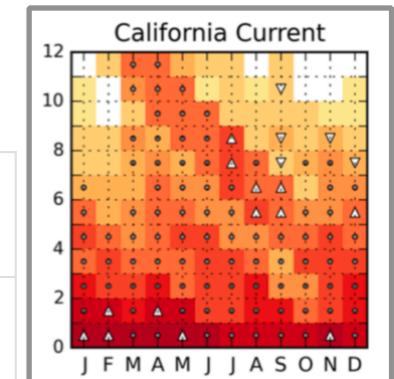
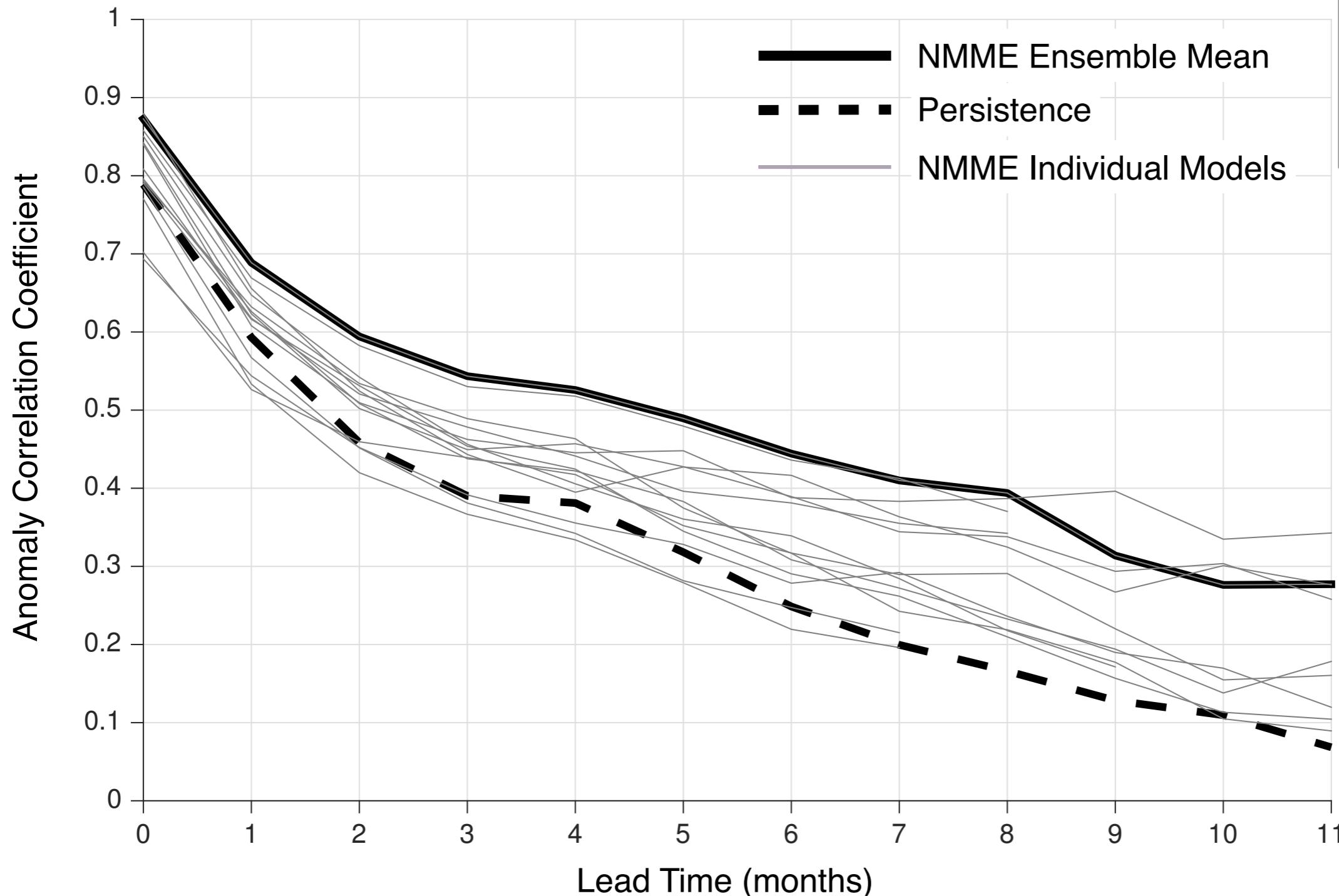


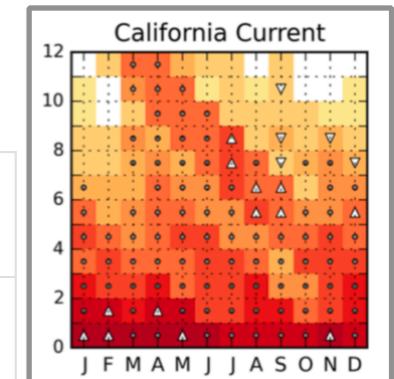
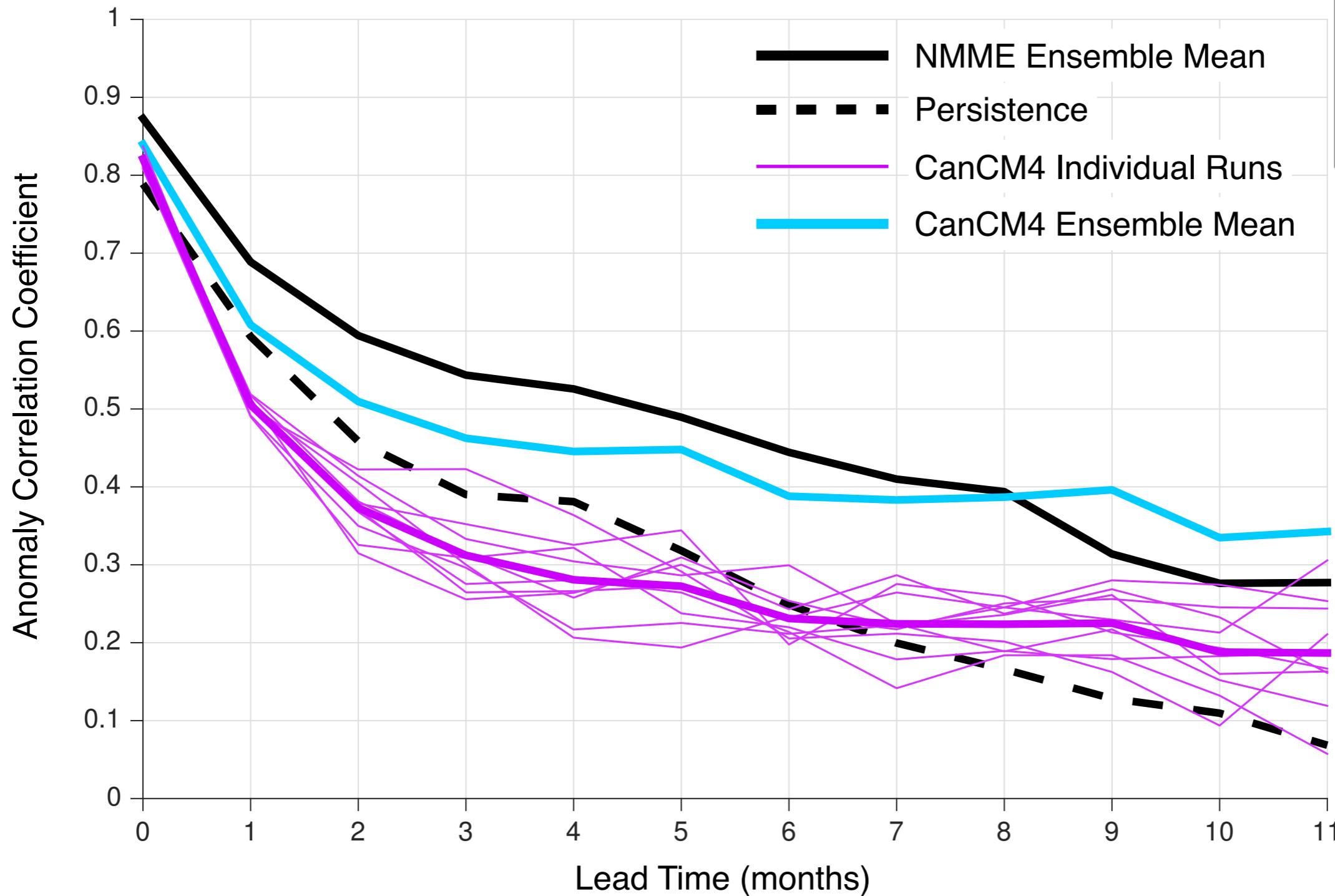
<http://www.cpc.ncep.noaa.gov/products/NMME/>

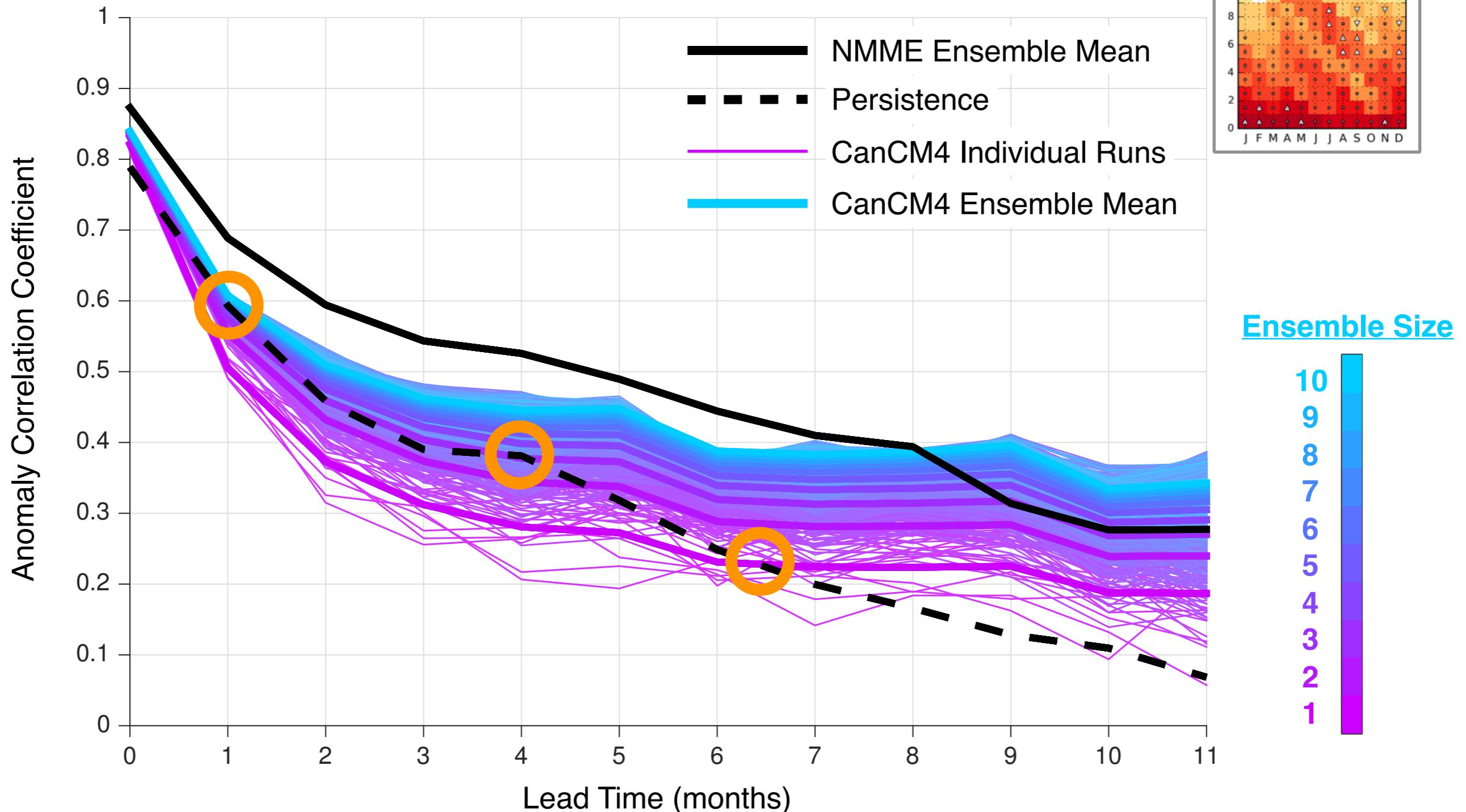
Stock et al. (2015)
Hervieux et al. (2017)

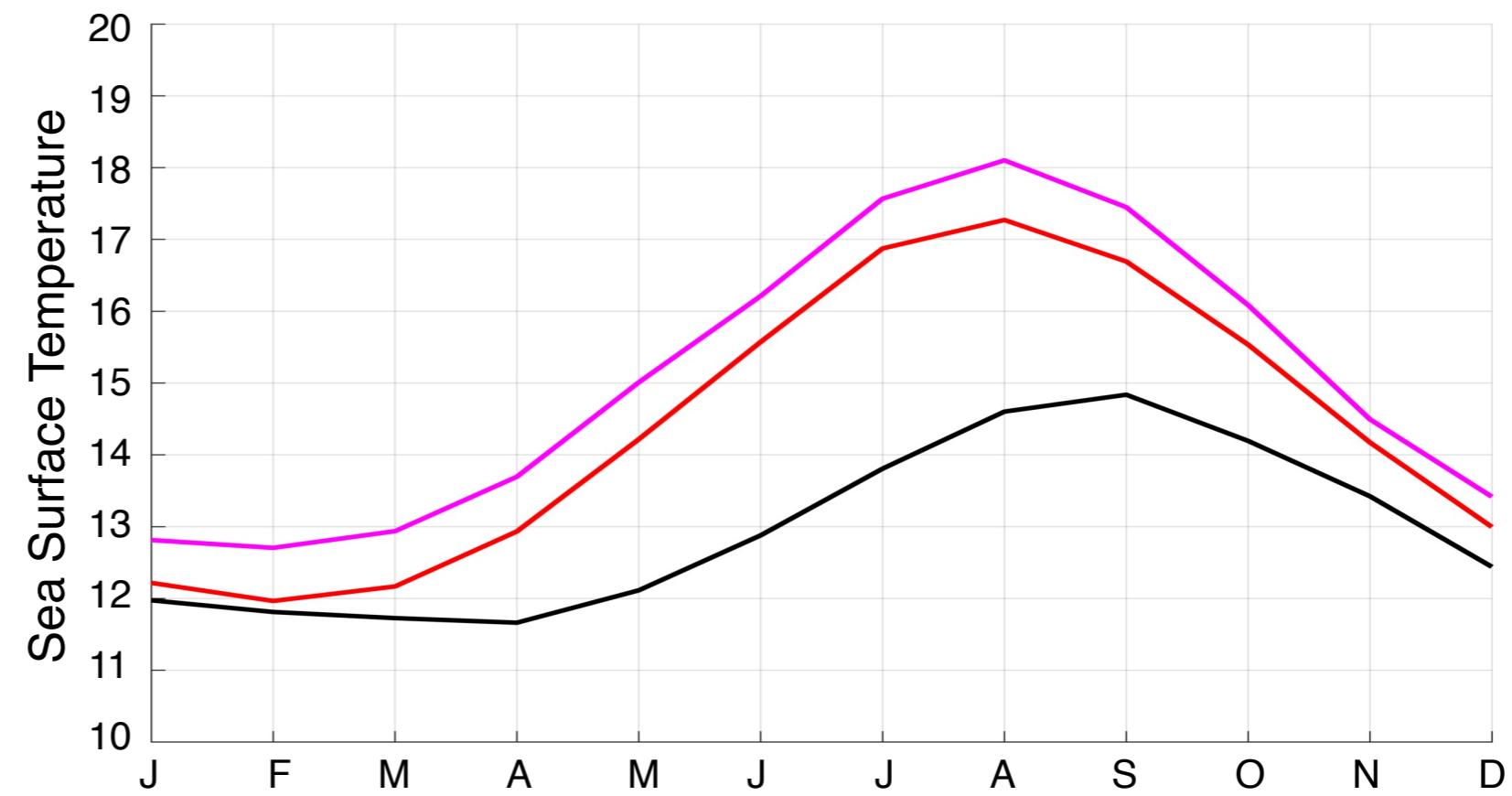
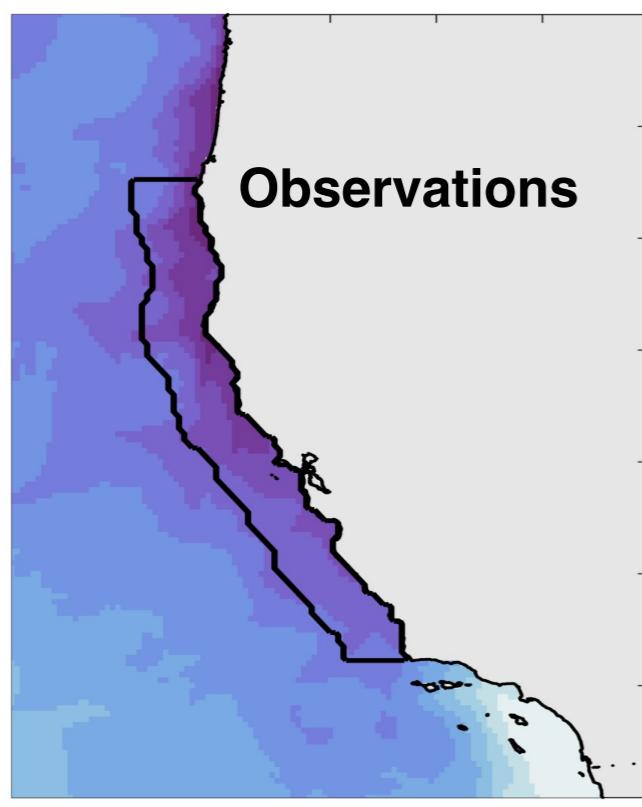
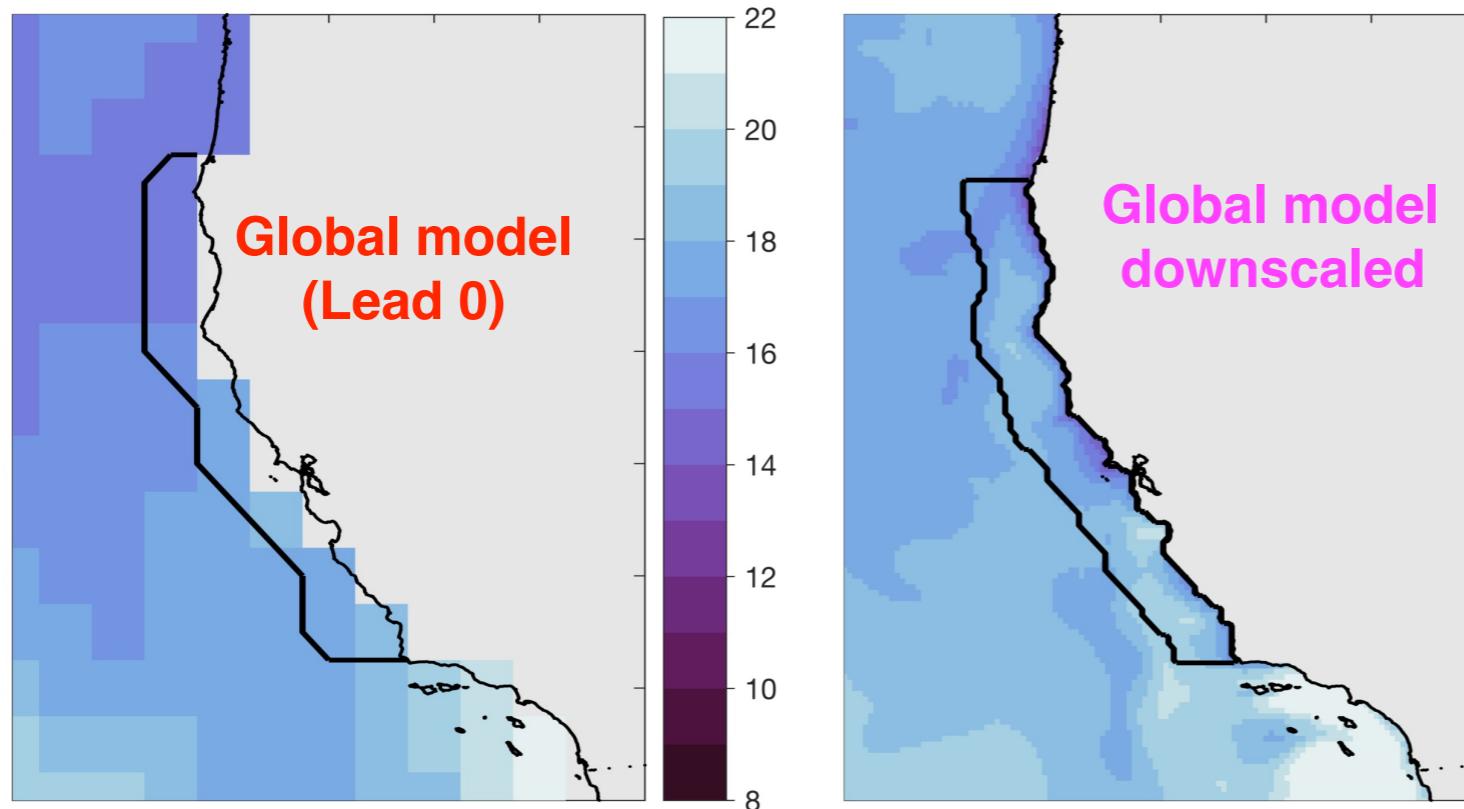
NMME SST Forecast Skill for North American LMEs

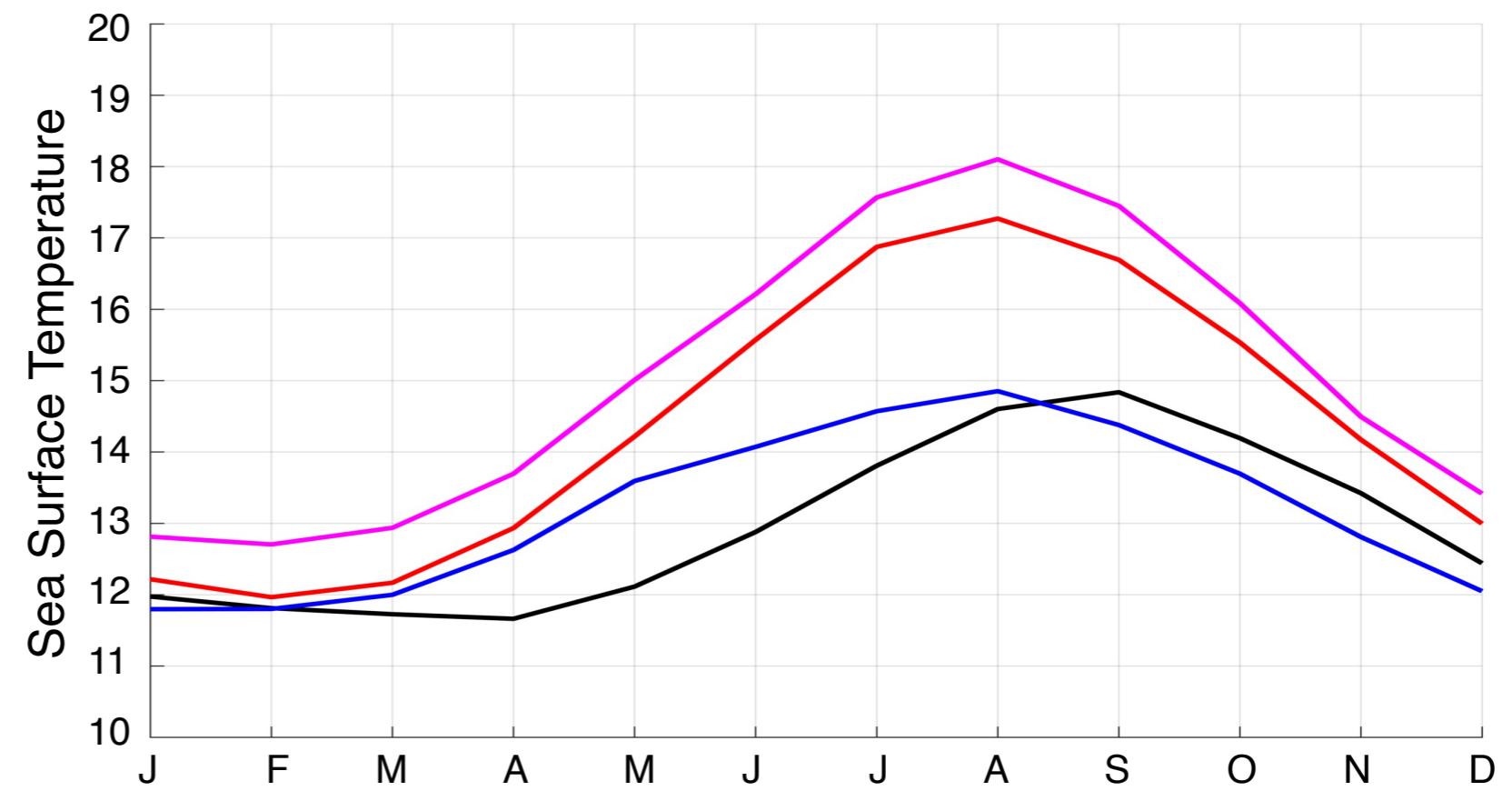
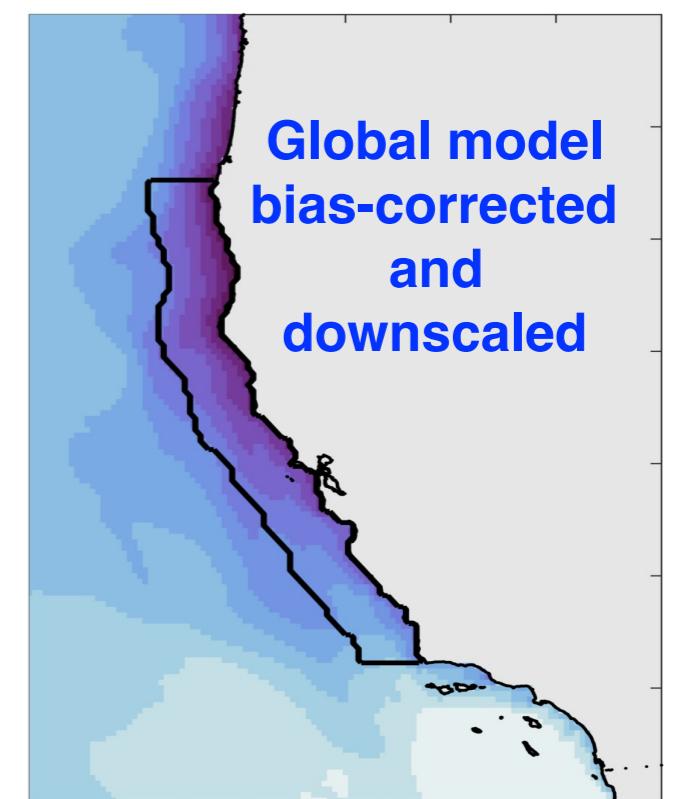
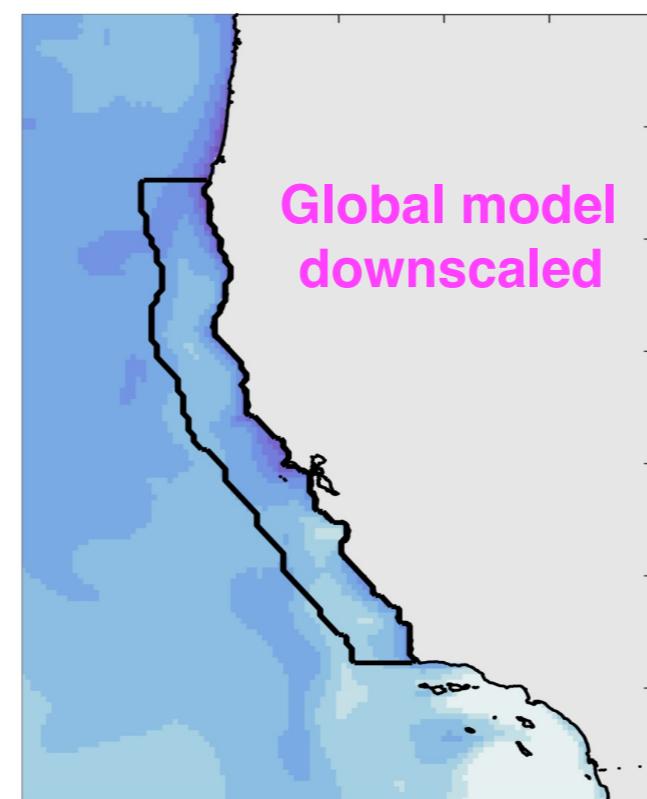
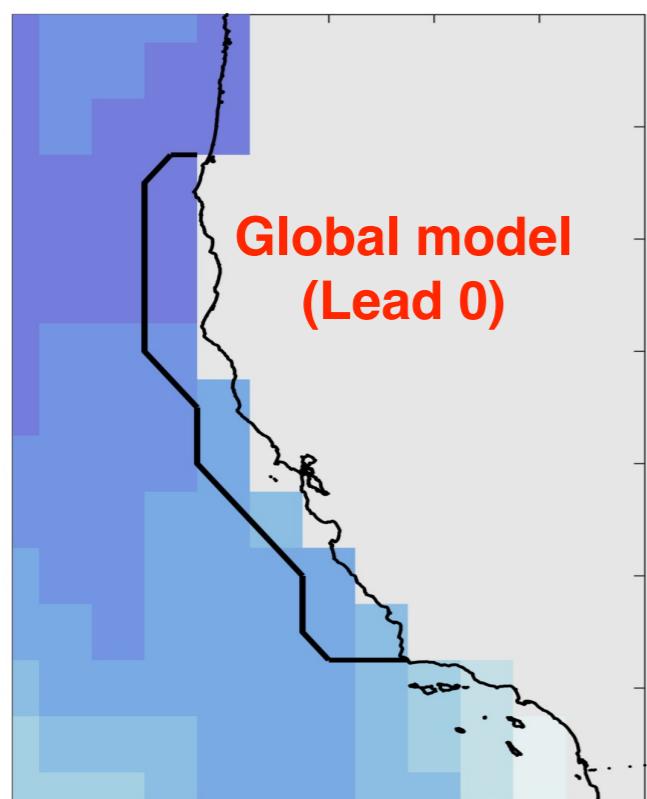


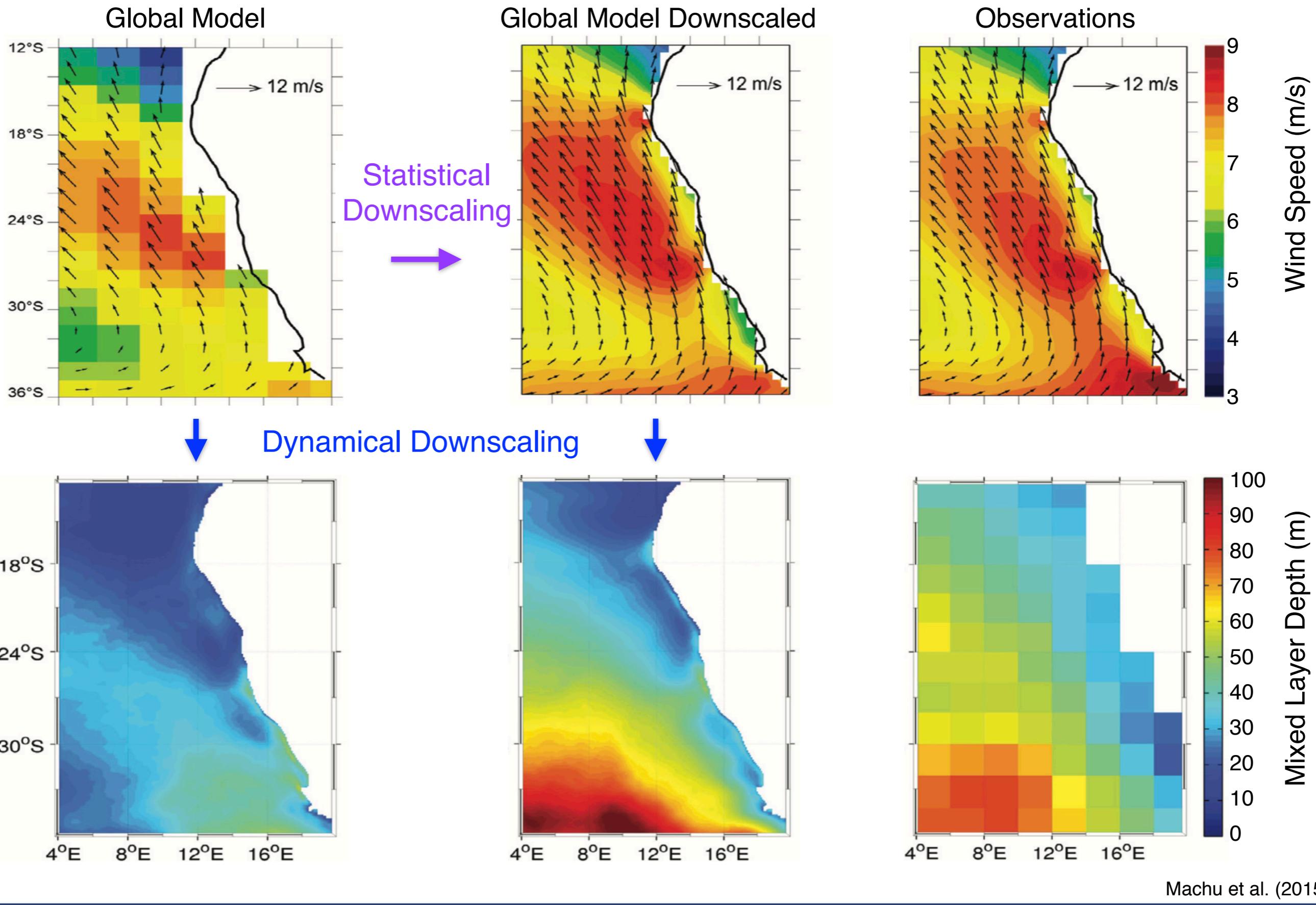


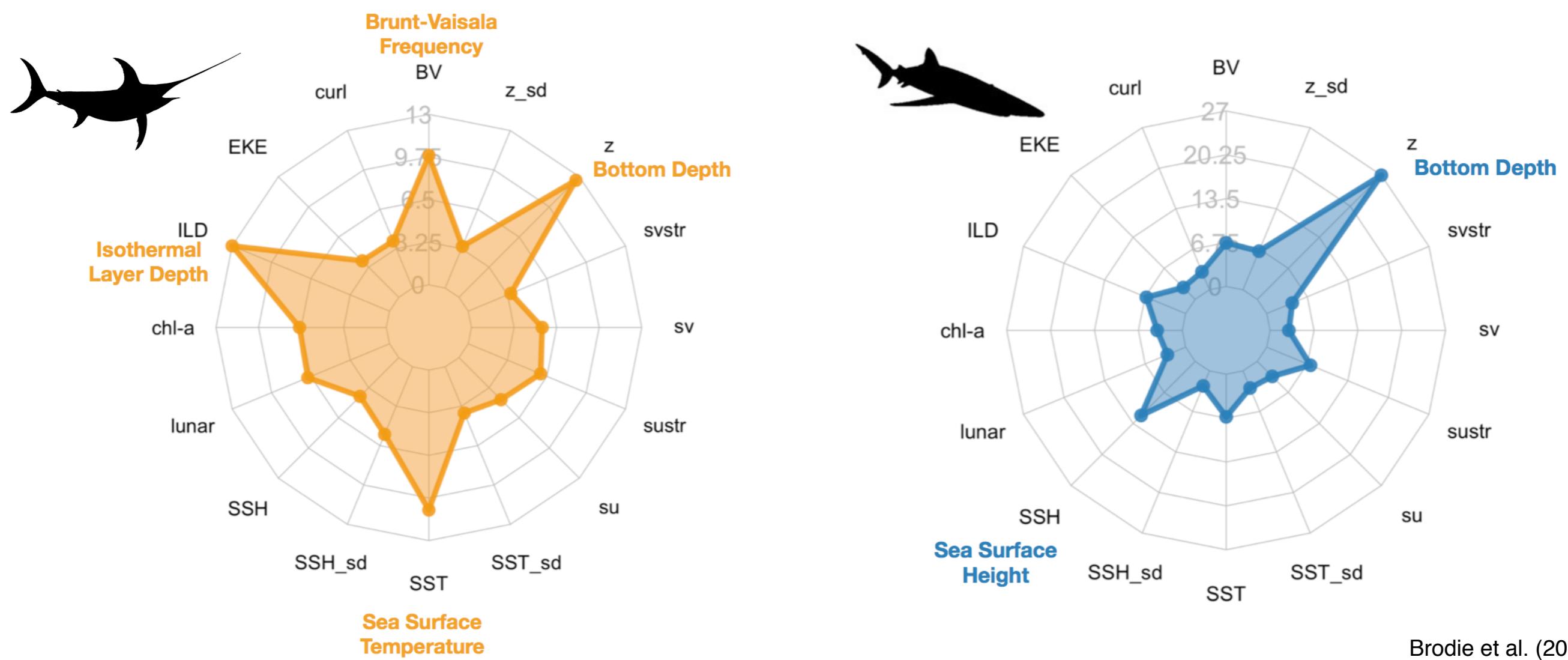
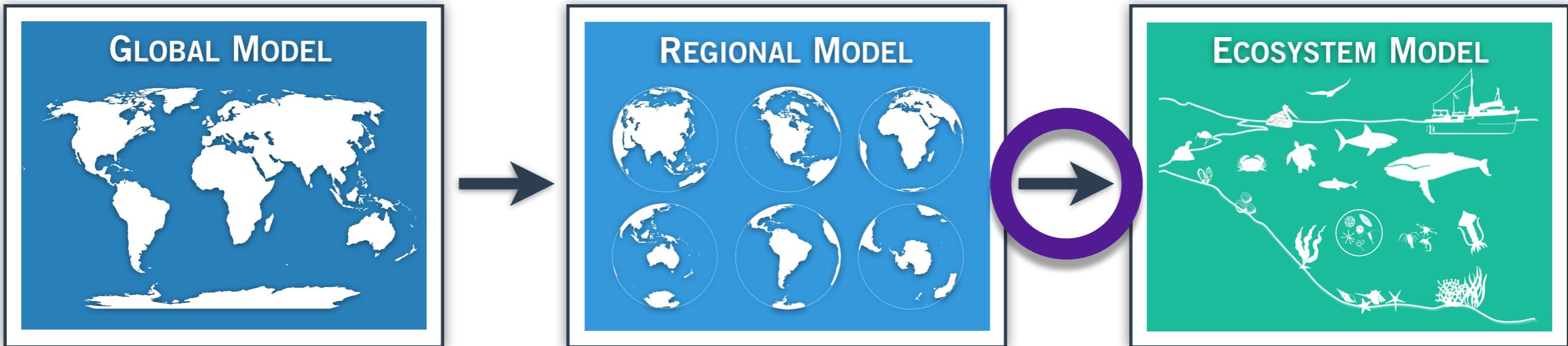


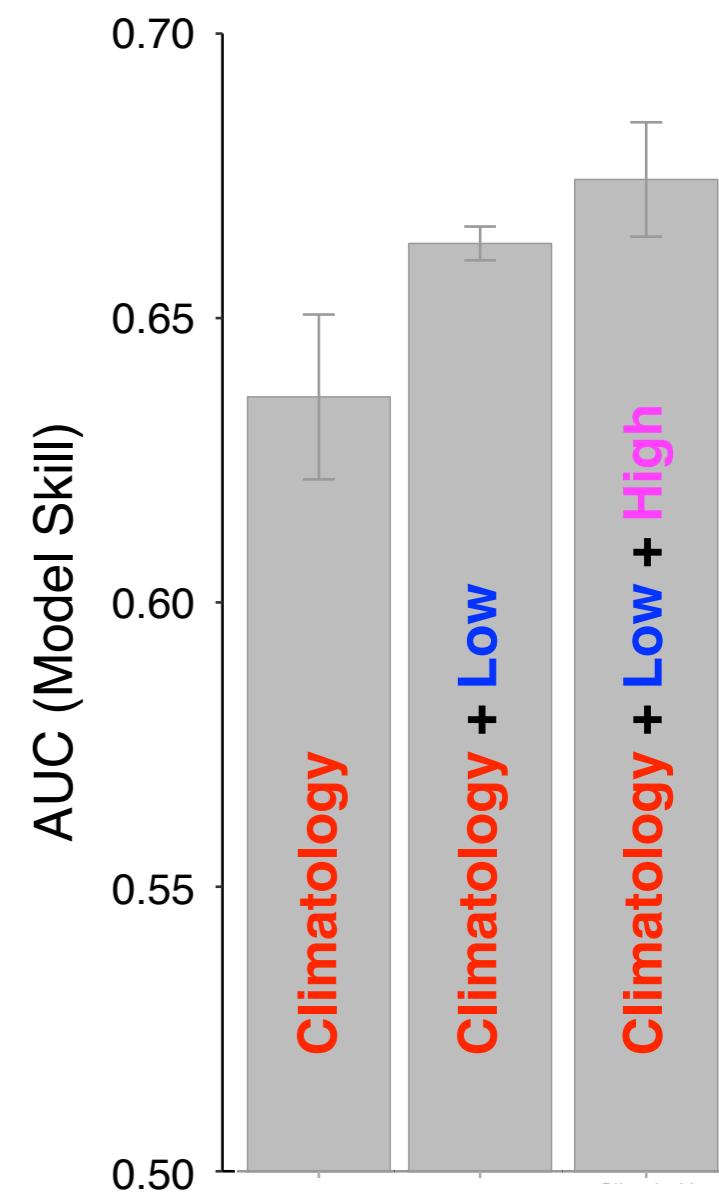
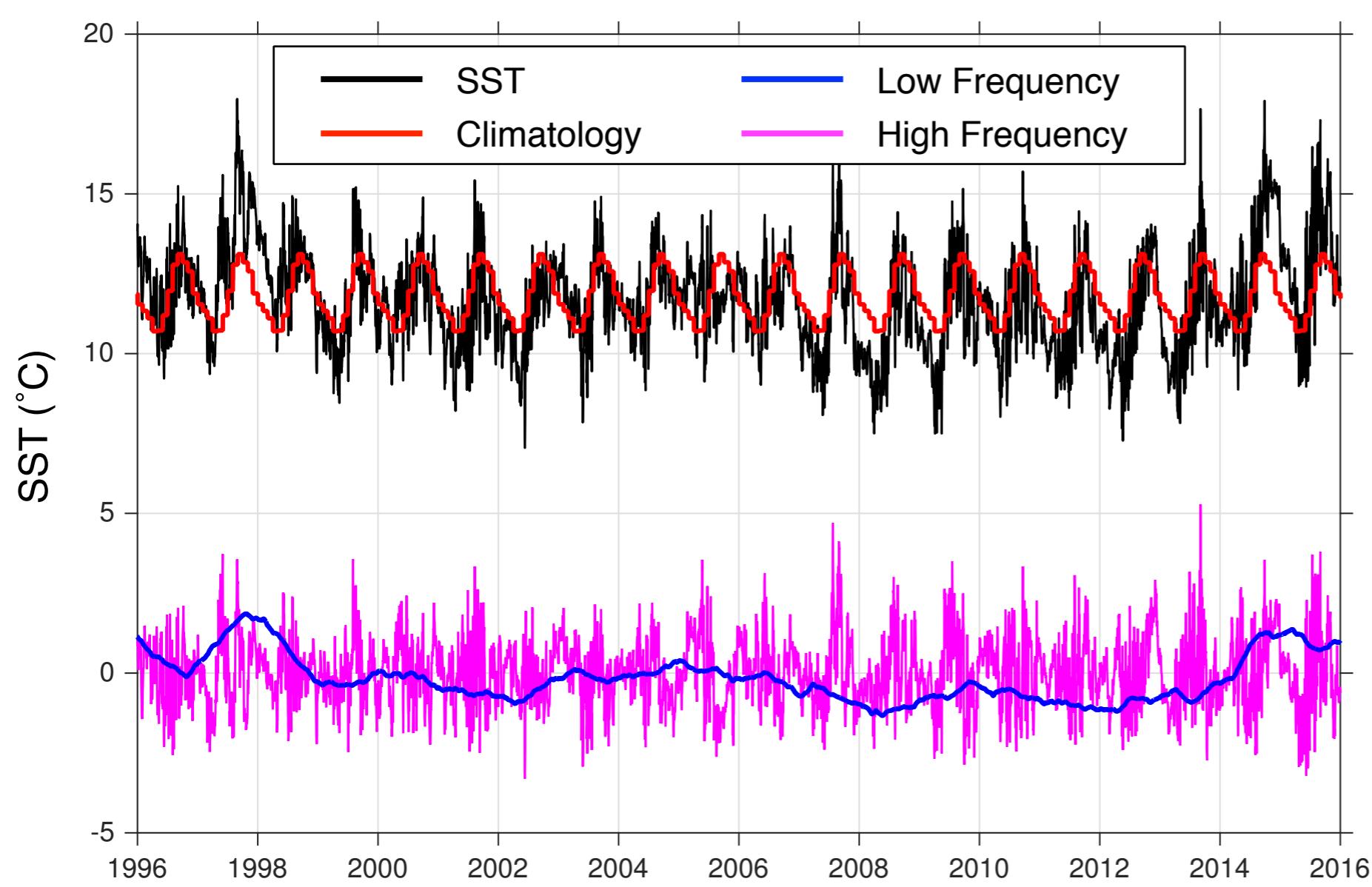
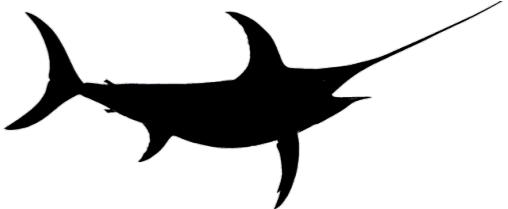
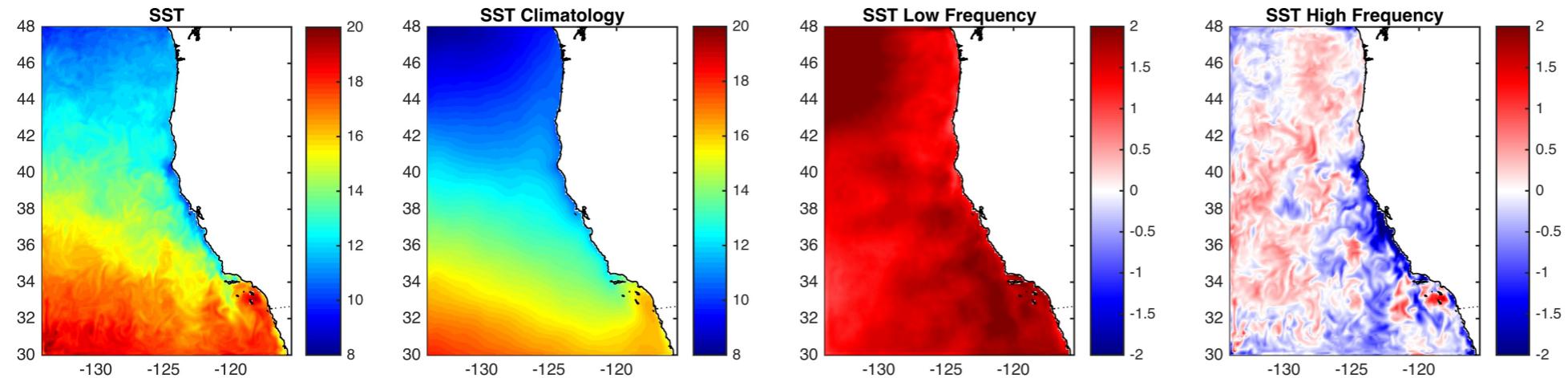


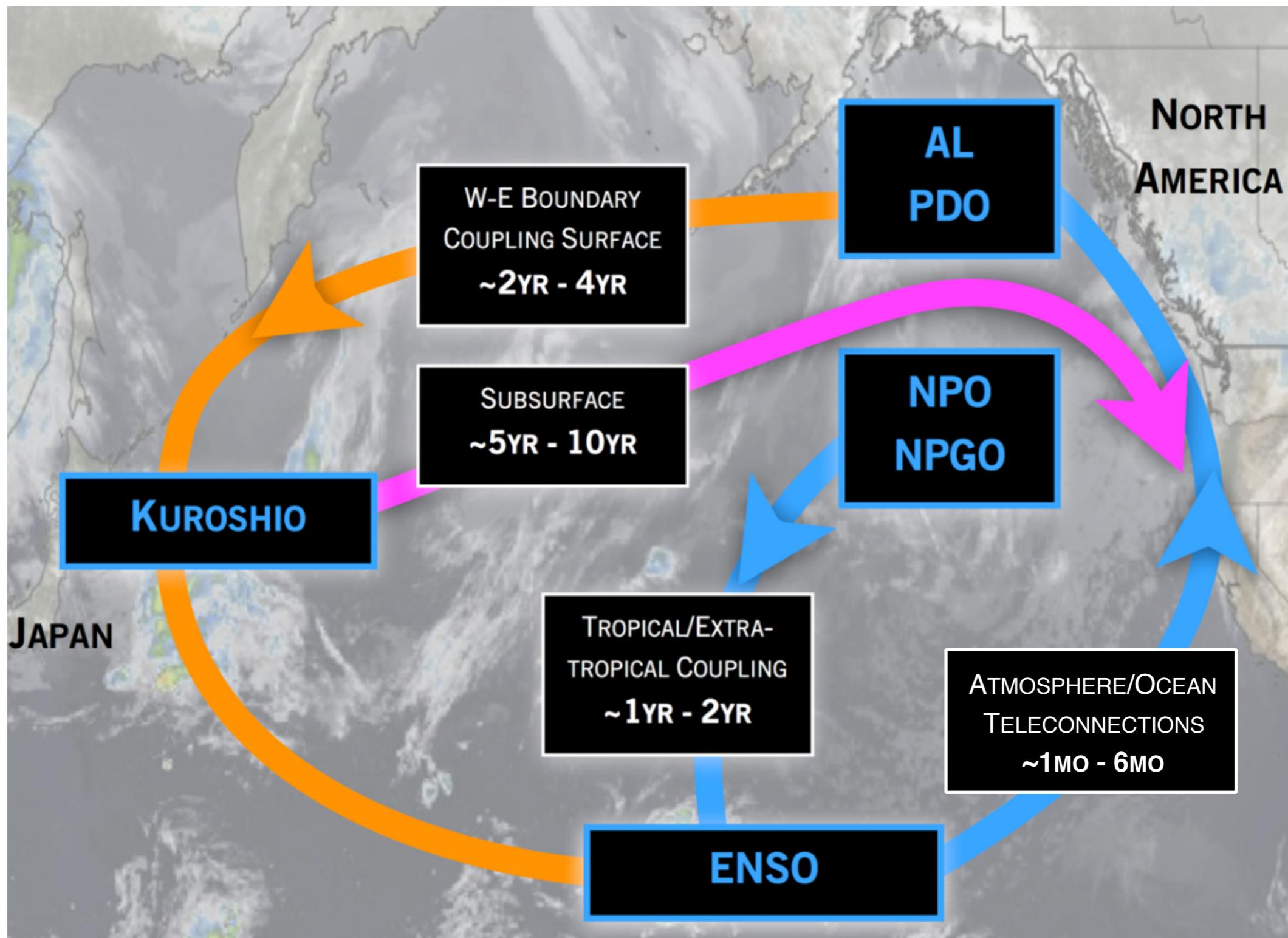




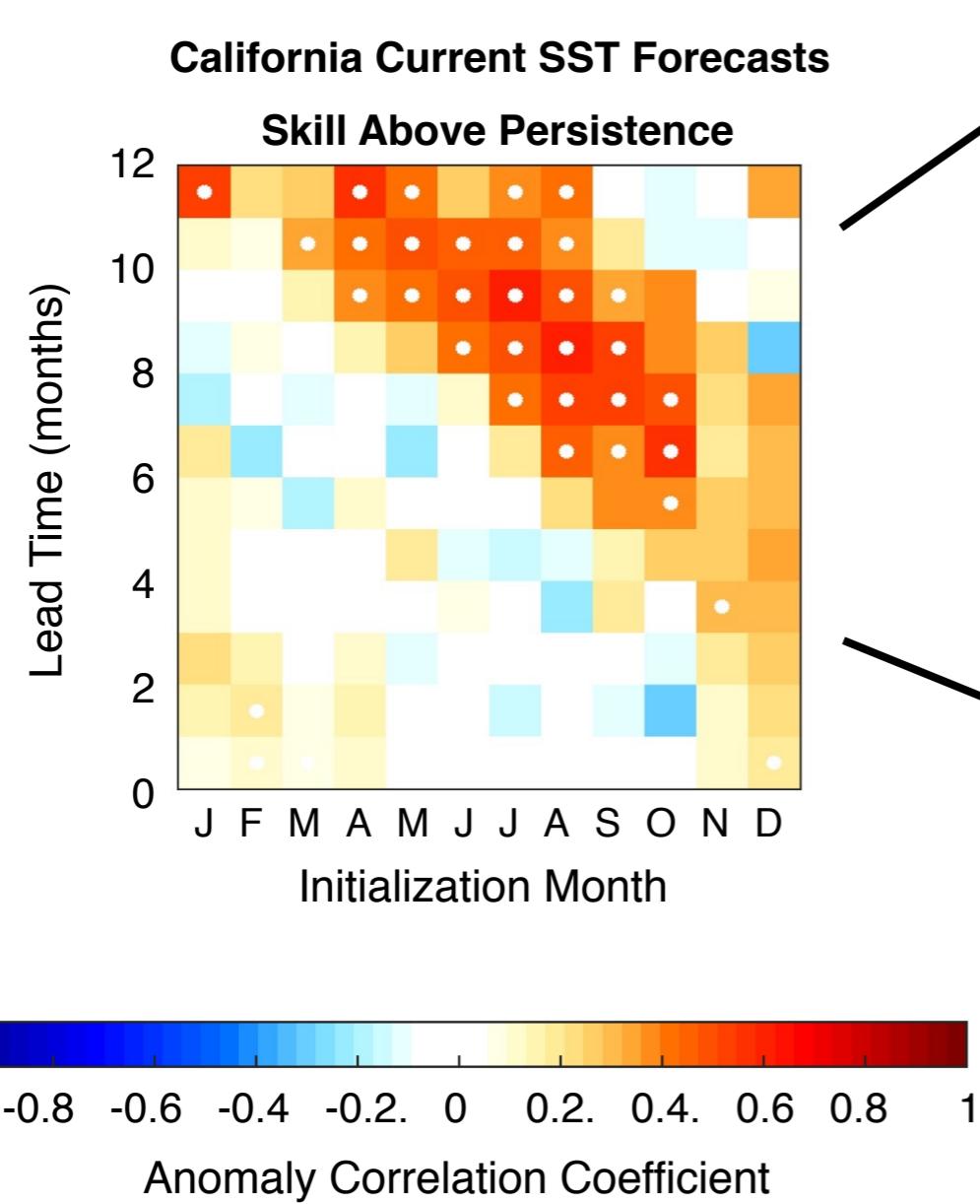




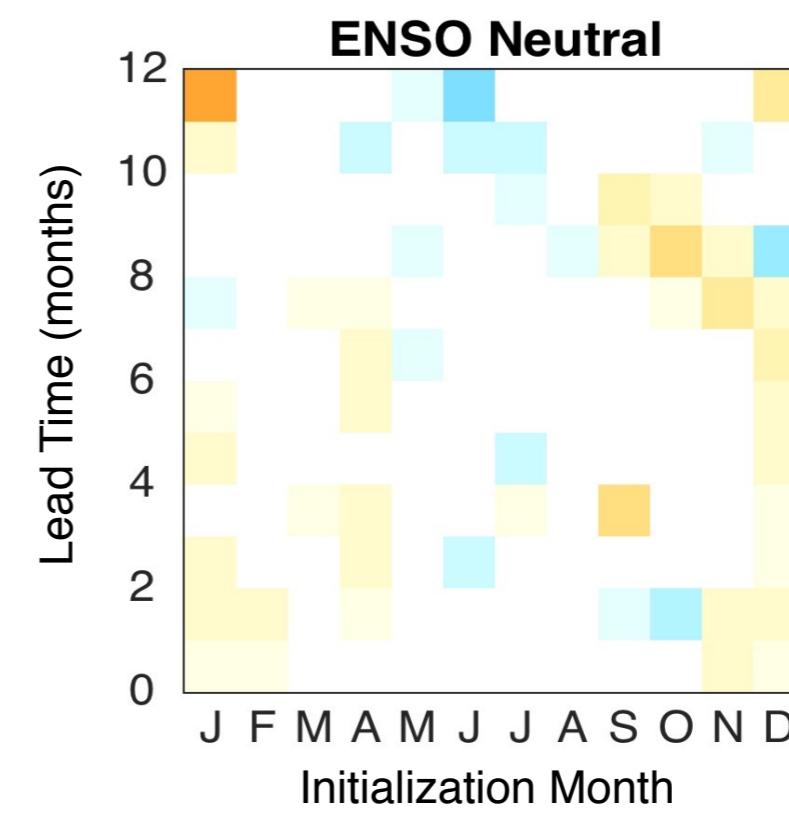
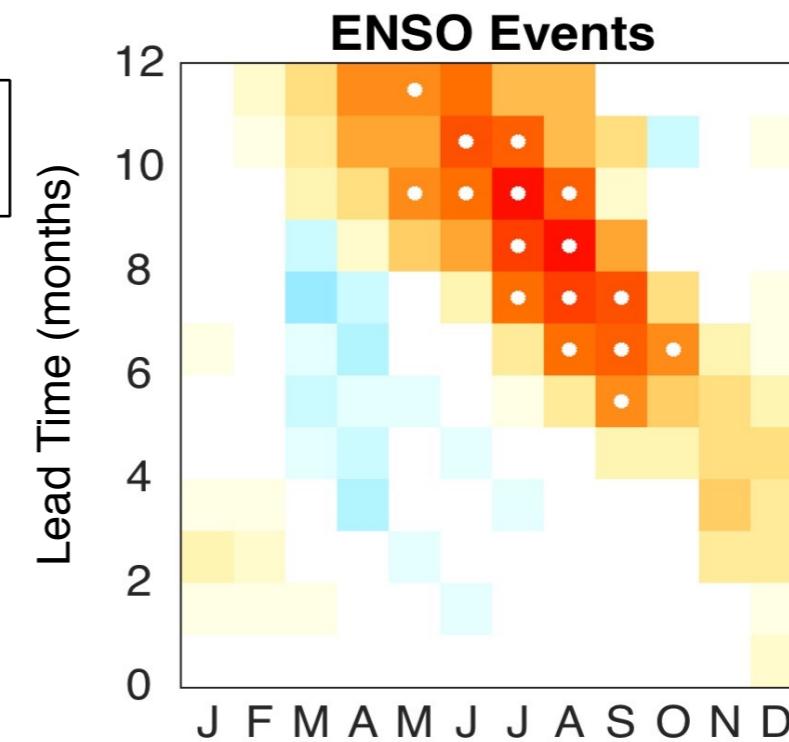




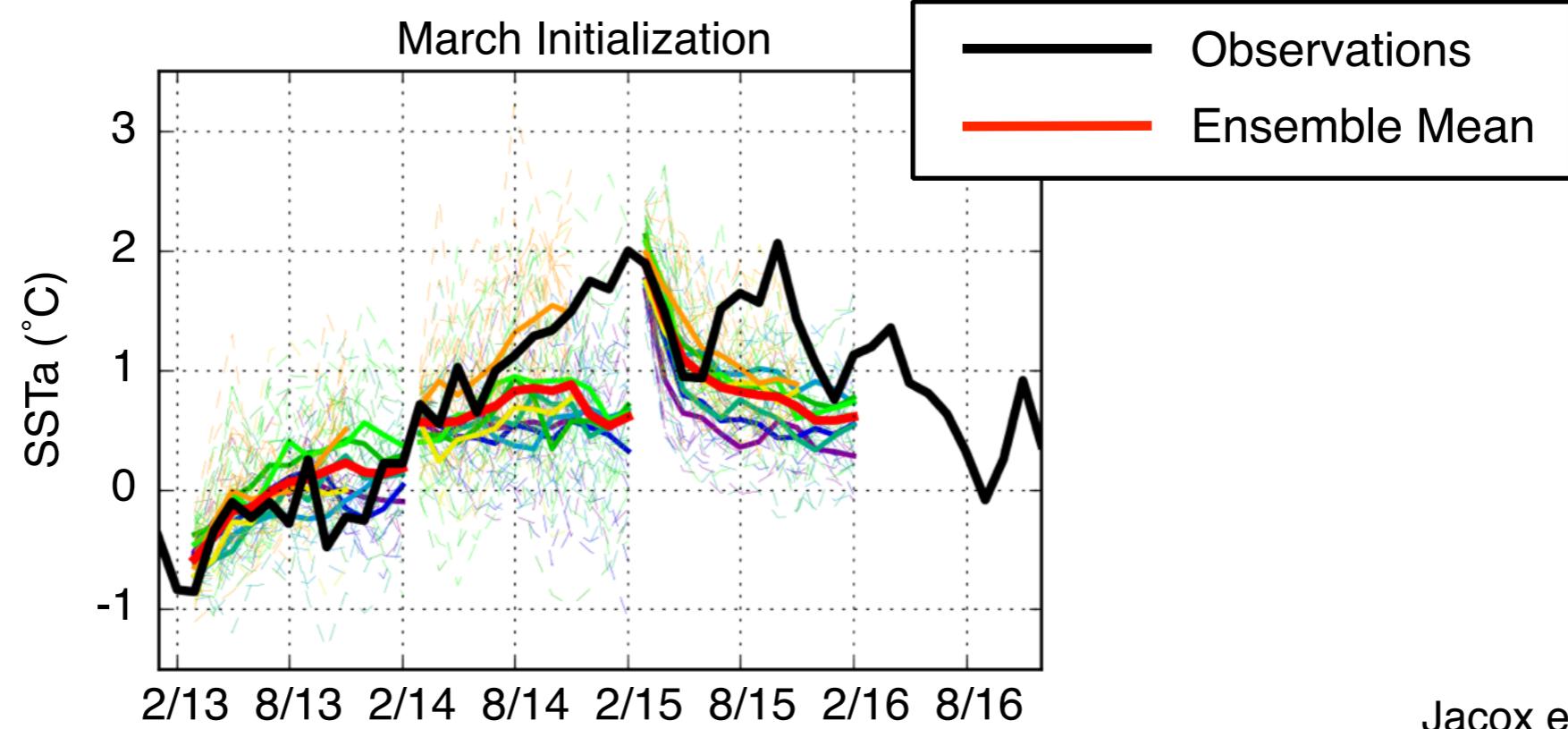
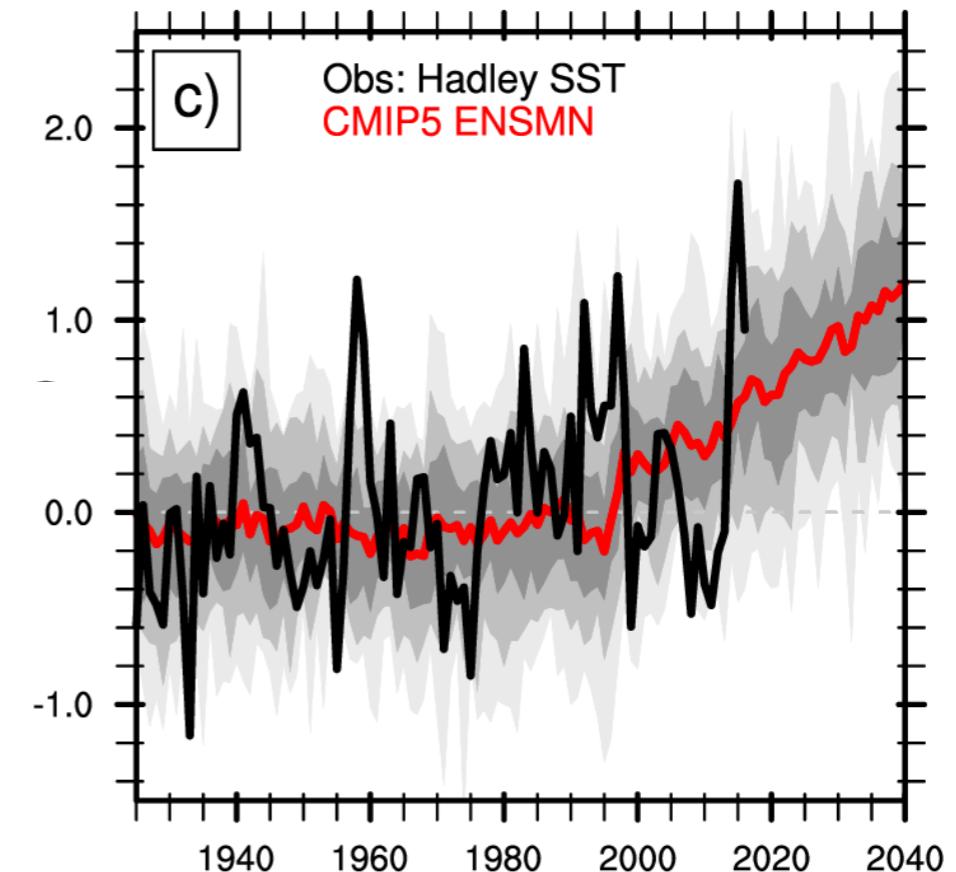
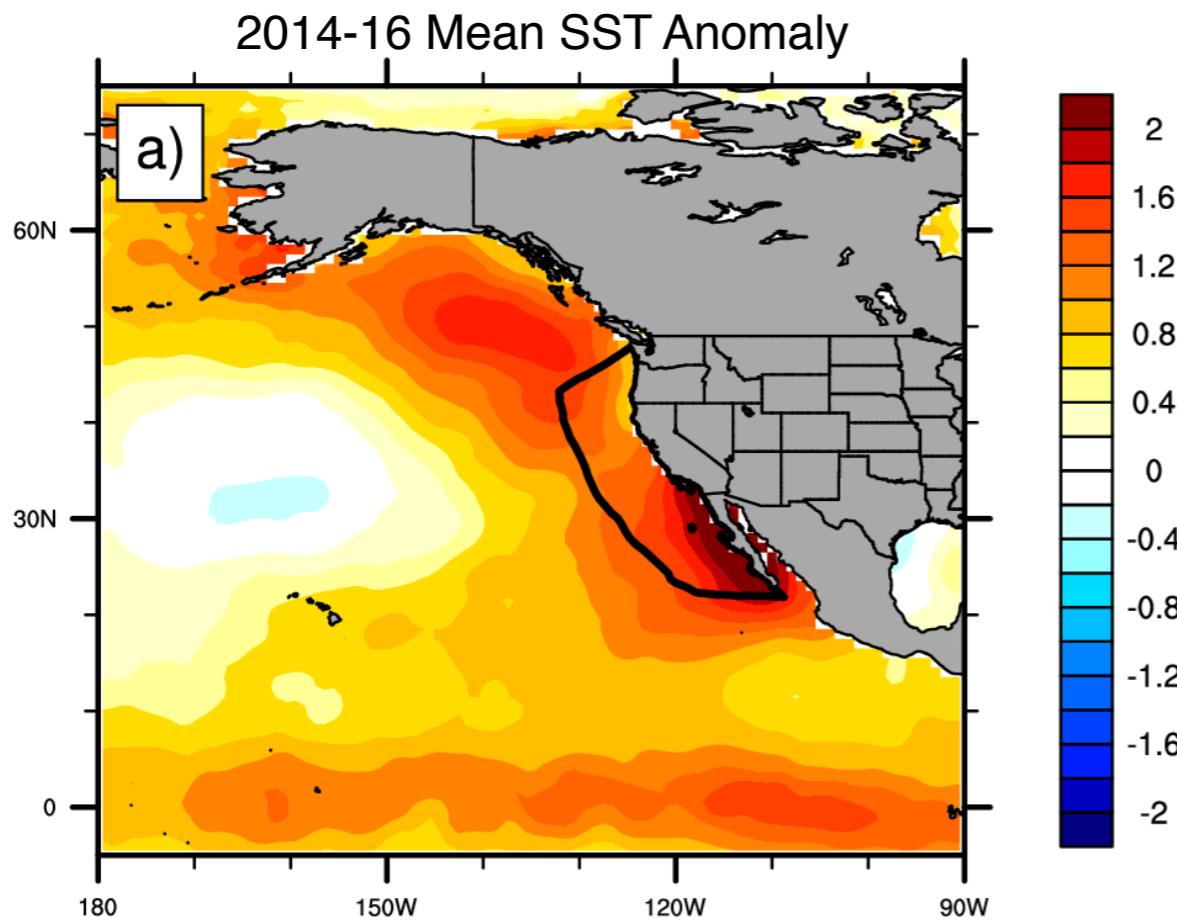
Courtesy Manu Di Lorenzo



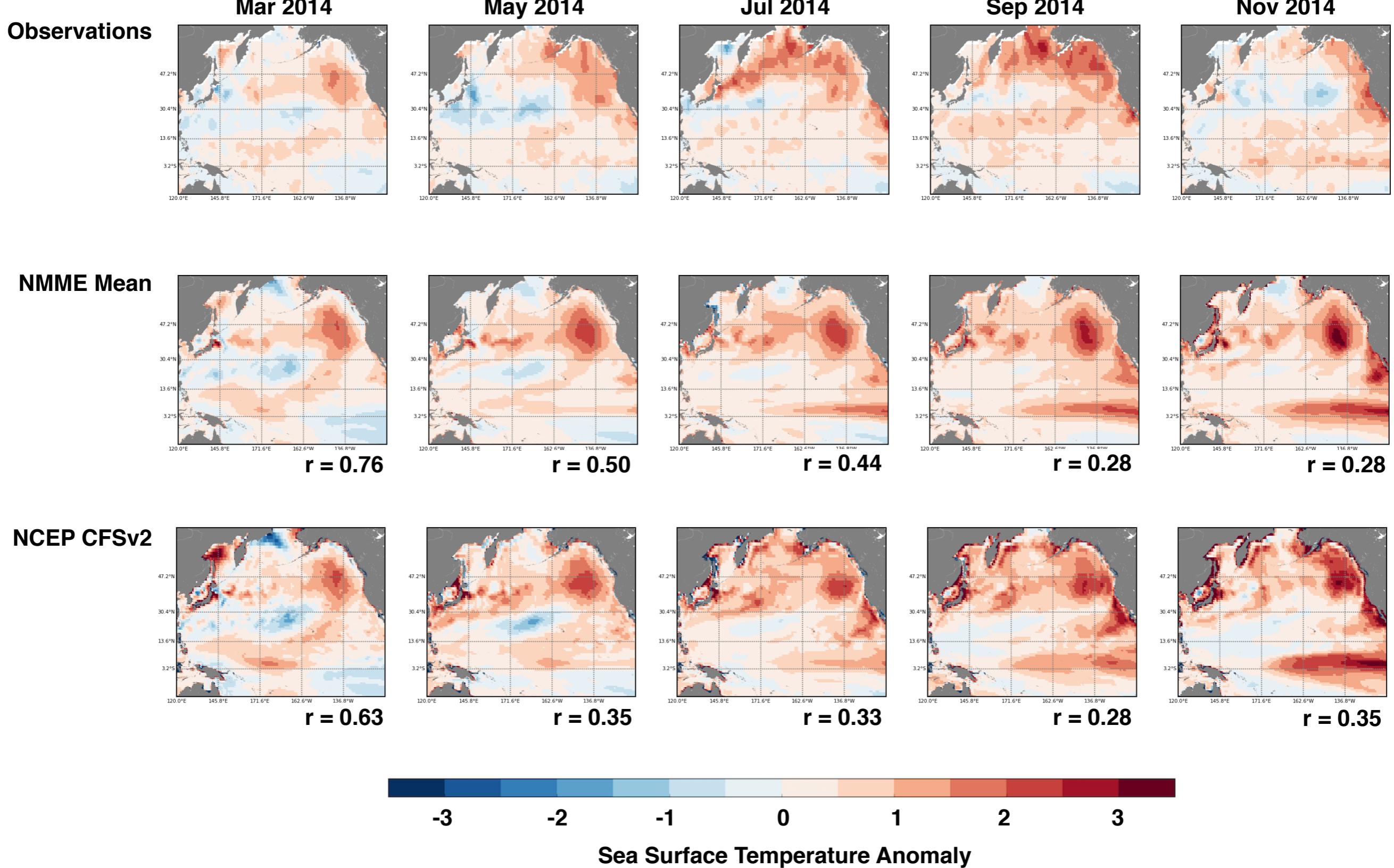
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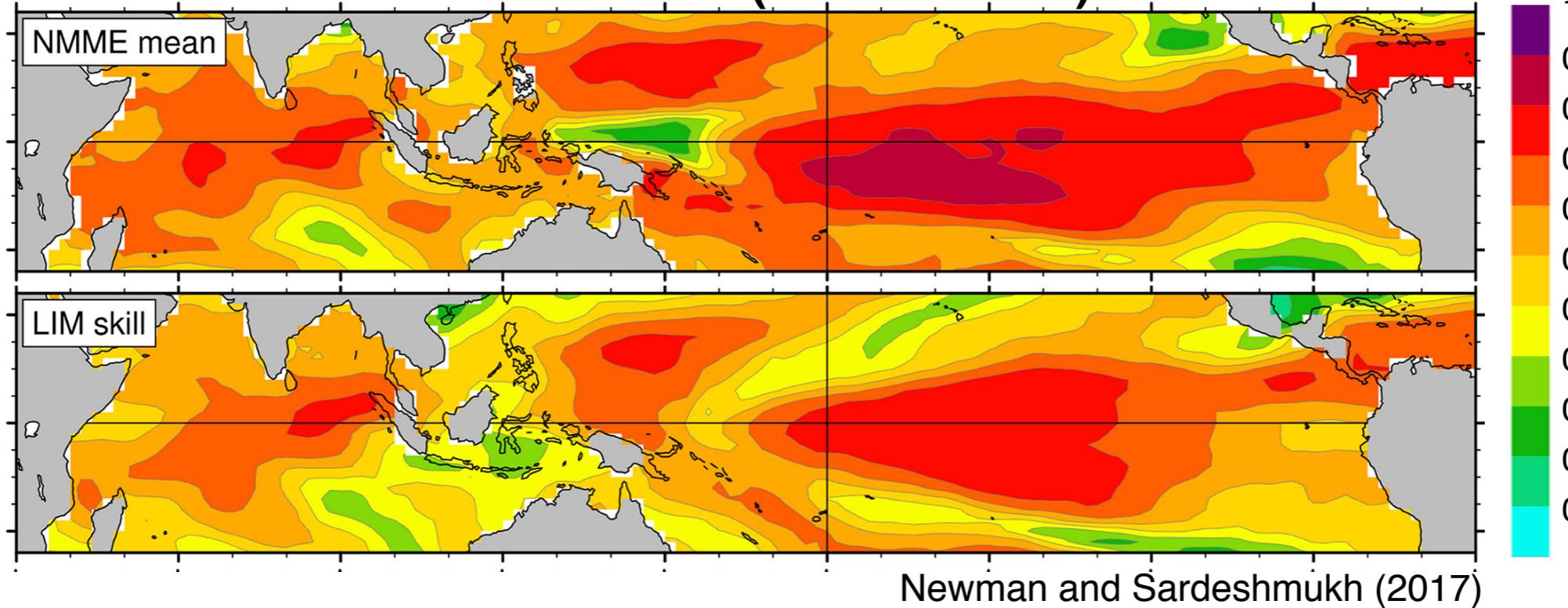
Jacox et al. (2017)



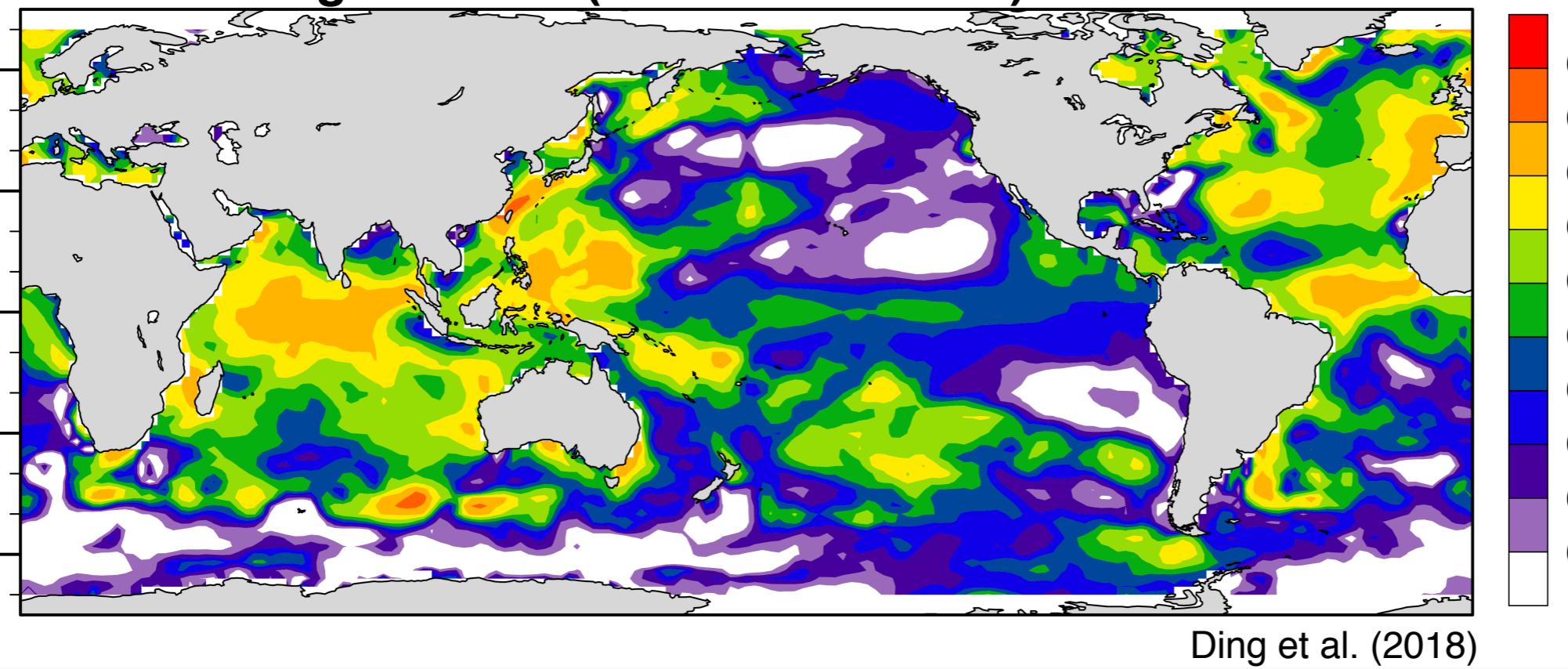
Jacox et al., BAMS (2017)



Linear Inverse Model Forecast (6 month lead)



Model Analog Forecast (13-24 month lead)



Technical Priorities

Ensembles (multiple models, multiple runs)

Dynamical downscaling (better resolution of key coastal processes)

Bias correction of forcing

Near real time forcing fields for operational forecasts

Scientific Priorities

Mechanisms of predictability

Areas for model skill improvement (esp. relative to empirical approaches)

Predictable responses of living marine resources to climate forcing

Successes to Date

Demonstrable forecast skill (physical and biological) on seasonal timescales

Development of forecast model frameworks

Productive collaborations within NOAA and with academia

Engagement of end users (management and industry)